### Formula II

wherein:

X is oxygen, methylene, difluoromethylene, imido;

n = 0, 1, or 2;

m = 0, 1, or 2;

n + m = 0, 1, 2, 3, or 4; and

B and B' are each independently a purine residue or a pyrimidine residue linked through the 9- or 1- position, respectively;

 $Z = OH \text{ or } N_3;$ 

 $Z' = OH \text{ or } N_3;$ 

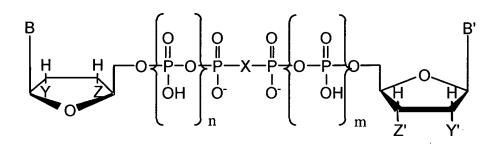
Y = H or OH;

Y' = H or OH;

provided that when Z is  $N_3$ , Y is H and when Z' is  $N_3$ , Y' is H.

## 13. The method of Claim 12, wherein the compounds of Formula II are those of Formula IIa:

### Formula IIa





### wherein:

X=O; n+m=1 or 2; Z, Z', Y, and Y'=OH; B and B' are defined in Formulas IIc and IId, or X=O; n+m=3 or 4;Z, Z', Y, and Y'=OH; B=uracil; B' is defined in Formulas IIc and IId; or X=O; n+m=1 or 2; Z, Y, and Z'=OH; Y'=H; B=uracil; B' is defined in Formulas IIc and IId; or X=O; n+m=0, 1, or 2;Z and Y=OH;  $Z'=N_3;$ Y'=H;

B=uracil;

X=0;

n+m=0, 1, or 2;

Z and  $Z'=N_3$ ;

Y and Y'=H;

B and B'=thymine; or

 $X=CH_2$ ,  $CF_2$ , or NH;

n and m=1;

Z, Z', Y, and Y'=OH;

B and B' are defined in Formulas IIc and IId:

# $\int_{0}^{\infty}$

## Formula IIc

$$R_3$$
 $R_1$ 
 $R_2$ 
 $R_3$ 
 $R_4$ 
 $R_3$ 
 $R_4$ 
 $R_5$ 
 $R_4$ 
 $R_5$ 
 $R_4$ 
 $R_5$ 
 $R_7$ 
 $R_7$ 
 $R_7$ 
 $R_8$ 
 $R_9$ 
 $R_9$ 

Wherein R<sub>1</sub> of the 6-HNR<sub>1</sub> group and R<sub>3</sub> are chosen from the group consisting of:

- (a) arylalkyl (C<sub>1-6</sub>) groups with the aryl moiety optionally substituted,
- (b) alkyl,
- (c) (carbamoylmethyl),
- (d)  $\omega$ -amino alkyl (C<sub>2-10</sub>),

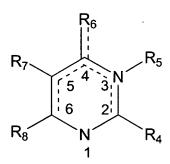
- (e)  $\omega$ -hydroxy alkyl (C<sub>2-10</sub>),
- (f)  $\omega$ -thiol alkyl (C<sub>2-10</sub>),
- (g)  $\omega$ -carboxy alkyl (C<sub>2-10</sub>),
- (h) the  $\omega$ -acylated derivatives of (b), (c) or (d) wherein the acyl group is either acetyl, trifluroacetyl, benzoyl, or substituted-benzoyl alkyl( $C_{2-10}$ ),
- (i)  $\omega$ -carboxy alkyl (C<sub>2-10</sub>) as in (e) above wherein the carboxylic moiety is an ester or an amide, and
  - (j) hydrogen;

R<sub>2</sub> is O or is absent; or

R<sub>1</sub> and R<sub>2</sub> taken together may form optionally substituted 5-membered fused imidazole ring;

### Formula IId





wherein:

 $R_4$  is hydroxy, mercapto, amino, cyano, aralkoxy,  $C_{1-6}$  alkylthio,  $C_{1-6}$  alkoxy,  $C_{1-6}$  alkylamino or dialkylamino, wherein the alkyl groups of said dialkylamino are optionally linked to form a heterocycle;

 $R_5$  is hydrogen, acyl,  $C_{1-6}$  alkyl, aroyl,  $C_{1-5}$  alkanoyl, benzoyl, or sulphonate;

R<sub>6</sub> is hydroxy, mercapto, alkoxy, aralkoxy, C<sub>1-6</sub>-alkylthio, C<sub>1-5</sub> disubstituted amino, triazolyl, alkylamino or dialkylamino, wherein the alkyl groups of said

dialkylamino are optionally linked to form a heterocycle or linked to  $N^3$  to form an optionally substituted ring; or

R<sub>5</sub> - R<sub>6</sub> together forms a 5 or 6-membered saturated or unsaturated ring bonded through N or O at R<sub>6</sub>, wherein said ring is optionally substituted;

R<sub>7</sub> is selected from the group consisting of:

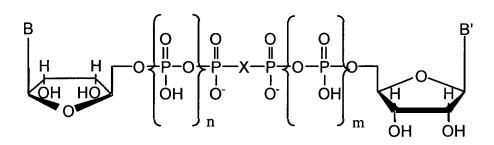
- (a) hydrogen,
- (b) hydroxy,
- (c) cyano,
- (d) nitro,
- (e) alkenyl, wherein the alkenyl moiety is optionally linked through oxygen to form a ring optionally substituted with alkyl or aryl groups on the carbon adjacent to the oxygen,
- (f) substituted alkynyl
- (g) halogen,
- (h) alkyl,
- (i) substituted alkyl,
- (j) perhalomethyl,
- (k)  $C_{2-6}$  alkyl,
- (1)  $C_{2-3}$  alkenyl,
- (m) substituted ethenyl,
- (n) C<sub>2-3</sub> alkynyl and
- (o) substituted alkynyl when R<sub>6</sub> is other than amino or substituted amino; R<sub>8</sub> is selected from the group consisting of:
  - (a) hydrogen,
  - (b) alkoxy,
  - (c) arylalkoxy,



- (d) alkylthio,
- (e) arylalkylthio,
- (f) carboxamidomethyl,
- (g) carboxymethyl,
- (h) methoxy,
- (i) methylthio,
- (j) phenoxy and
- (k) phenylthio.
- 14. The method of Claim 12, wherein the compounds of Formula II are those of Formula IIb:

### Formula IIb





wherein:

X is oxygen, methylene, difluoromethylene, or imido;

$$n = 0 \text{ or } 1;$$

$$m = 0 \text{ or } 1;$$

$$n + m = 0, 1, or 2;$$
 and

B and B' are each independently a purine residue, as in Formula IIc as described in claim 2, or a pyrimidine residue, as in Formula IId as described in claim 2, linked through the 9- or 1-position, respectively; provided that when B and B' are uracil, attached at N-1 position to the ribosyl moiety, then the total of m + n equals 3 or 4 when X is oxygen.